

**RADIALLY EXPANDABLE BEAD MOLDING RING FOR A TIRE MOLD**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

This application relates to a US application entitled EXPANDABLE BEAD MOLDING RING FOR A TIRE MOLD, Attorney's Docket No. DN2002015, having a filing date concurrent with that of the present invention.

**TECHNICAL FIELD OF THE INVENTION**

The present invention relates to the molding of tires. In particular, it pertains to methods and apparatus for molding a tire bead using a radially expandable bead molding ring.

**BACKGROUND OF THE INVENTION**

Reference is made herein to an "undercut" bead, referring to the shape of the bead base (the radially inner surface of a tire bead that seats in the bead seat portion of a wheel rim). Tire bead bases are most commonly substantially flat and are angled from zero to several degrees relative to the axial direction with the bead base angle opening axially outward. An undercut bead base may be similarly shaped except that the bead base angle opens axially inward.

Examples of tires with undercut bead bases, and examples of wheel rims using such tires, are seen in U.S. Pat. No. 6,092,575. In particular, it should be noted that a common variant of a tire with the undercut bead base design comprises beads of two different diameters on the same tire.

In order to mold certain tire constructions, such as those having undercut beads, it becomes necessary to introduce a portion of the tire mold known as the bead molding ring or counter-molding ring into the interior of the tire in order to engage a molding surface against the bead base. In the prior art, means are known for accomplishing the molding of an undercut portion of a tire bead. For example, U.S. Pat. No. 5,129,802 proposes using two counter-molding rings (bead molding rings) for the axially and radially inner portion of the bead, said rings being continuous. In order to introduce the counter-molding rings into the interior of the tire, it is necessary to deform the raw blank of the tire by ovalizing at least one of the beads, so that the bead can be made to pass beyond the counter-molding ring or rings.

Rings for molding the radially and axially inner portion of a bead have also been described in connection with so-called membrane-less vulcanizing presses. See, for example, U.S. Pat. No. 4,236,883 (referred to hereinafter as the '883 patent), which discloses such rings, in this instance made in several segments circumferentially adjacent in molding position. These

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